Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army

Date: May 2017

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

2040: Research, Development, Test & Evaluation, Army I BA 7: Operational

PE 0205778A I Guided Multiple-Launch Rocket System (GMLRS)

Systems Development

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	36.032	38.044	102.807	-	102.807	164.015	131.354	51.665	65.561	Continuing	Continuing
EG2: GMLRS Alternative Warheads	-	0.306	0.000	0.000	-	0.000	0.000	11.700	14.700	24.700	0.000	51.406
EG3: Guided MLRS	-	35.726	38.044	102.807	-	102.807	164.015	119.654	36.965	40.861	Continuing	Continuing

A. Mission Description and Budget Item Justification

Projects EG2/EG3. GMLRS rockets are surface-to-surface artillery rockets fired from the Multiple Launch Rocket System (MLRS) and High Mobility Artillery Rocket System (HIMARS) launchers. GMLRS rockets provide 24/7, all-weather precision fires to engage both area and point targets at short, medium, and long ranges.

The GMLRS Program consists of three separate increments: GMLRS Dual Purpose Improved Conventional Munition (DPICM) cluster munition to engage area or imprecisely located targets; GMLRS Unitary utilizes a 200 pound high explosive warhead to engage point targets with limited collateral damage; and GMLRS Alternative Warhead (AW) which has been developed as a non-cluster munition to replace GMLRS DPICM. GMLRS DPICM Production was terminated in response to the June 2008 Department of Defense (DoD) Cluster Munitions Policy. GMLRS Unitary is currently in full rate production. GMLRS AW entered full rate production in FY 2015. The GMLRS AW rocket is 90% common with the Unitary variant.

The first increment was GMLRS DPICM. The second increment is GMLRS Unitary. The third increment is GMLRS AW. The fourth increment evolved into the Long Range Precision Fires (LRPF) program under a separate program element.

The GMLRS program will continue to leverage ongoing Science & Technology (S&T) efforts to extend range and increase survivability. The GMLRS extended range effort will be approximately 85% common with Increments 2 and 3. It will extend the current GMLRS capability to 150 km and allow for potential future growth capability in the payload section.

The FY2018 dollars in the amount of \$102.807 million will complete the testing and qualification of the Insensitive Munitions Propulsion System (IMPS); continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKE-M upgrade); evaluate rocket pod improvements; and initiate the design, qualification and testing of an extended range variant of the GMLRS.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army

Date: May 2017

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

2040: Research, Development, Test & Evaluation, Army I BA 7: Operational Systems Development

PE 0205778A I Guided Multiple-Launch Rocket System (GMLRS)

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
		· 		1 1 2010 000	
Previous President's Budget	36.727	22.044	30.177	-	30.177
Current President's Budget	36.032	38.044	102.807	-	102.807
Total Adjustments	-0.695	16.000	72.630	-	72.630
 Congressional General Reductions 	-	-			
 Congressional Directed Reductions 	-	-			
 Congressional Rescissions 	-	-			
 Congressional Adds 	-	-			
 Congressional Directed Transfers 	-	-			
Reprogrammings	-	-			
SBIR/STTR Transfer	-0.695	-			
 Adjustments to Budget Years 	0.000	0.000	-5.670	-	-5.670
PDM Directed	0.000	0.000	41.700	-	41.700
AlAMD Funding Moves	0.000	0.000	36.600	-	36.600
Amended FY2017	0.000	16.000	0.000	-	0.000

Change Summary Explanation

FY 2016 funding change due to SBIR/STTR transfer. FY 2017 funding was increased by \$16.000 million in support of the M-Code effort. FY 2018 funding was reduced by -\$5.670 million to account for the availability of prior year execution balances. FY 2018 funding was increased by \$78.300 million in support of the GMLRS extended range effort.

Exhibit R-2A, RDT&E Project Ju	ustification	: FY 2018 A	rmy							Date: May	2017	
Appropriation/Budget Activity 2040 / 7					PE 020577	am Elemen 78A / Guideo stem (GMLF	d Multiple-L	•	· • • • • • • • • • • • • • • • • • •			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EG2: GMLRS Alternative Warheads	-	0.306	0.000	0.000	-	0.000	0.000	11.700	14.700	24.700	0.000	51.406
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army funded the development of the Guided Multiple Launch Rocket System (GMLRS) Alternative Warhead (AW) increment under the EG2 - GMLRS AW project code. GMLRS AW has been developed as a non-cluster munition to replace GMLRS Dual Purpose Improved Conventional Munitions (DPICM) and service the same area and imprecisely-located targets. GMLRS DPICM Production was terminated in response to the June 2008 Department of Defense (DoD) Cluster Munitions Policy.

GMLRS AW successfully completed the combined Milestone C (MS C) and Full Rate Production (FRP) decision review on 8 April 2015. Initial Operational Capability (IOC) quantity of 54 pods delivered in September 2016. Full Materiel Release occurred in November 2016. The acquisition strategy is to procure AW as part of the annual GMLRS FRP contract.

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2018	FY 2018	FY 2018
	FY 2016	FY 2017	Base	oco	Total
Title: Conduct Development Engineering, Design Component Testing, and Performance Analysis.	0.306	-	-	-	-
Description: Funding is provided for the following effort					
FY 2016 Accomplishments: Completed test reports and performance assessments.					
Accomplishments/Planned Programs Subtotals	0.306	-	-	-	-

C. Other Program Funding Summary (\$ in Millions)

			FY 2018	FY 2018	FY 2018					Cost To	
<u>Line Item</u>	FY 2016	FY 2017	Base	OCO	<u>Total</u>	FY 2019	FY 2020	FY 2021	FY 2022	Complete	Total Cost
 GMLRS (C64400): 	251.060	402.579	273.445	189.544	462.989	180.409	319.623	268.534	358.795	Continuing	Continuing
GMLRS (C64400)											
 Guided MLRS (EG3): 	35.726	38.044	102.807	-	102.807	164.015	119.654	36.965	40.861	Continuing	Continuing
Guided MLRS (EG3)											
 GMLRS MOD (C57701): 	5.321	0.395	0.531	-	0.531	0.269	15.530	53.182	101.854	Continuing	Continuing
GMLRS MOD (C57701)											

PE 0205778A: Guided Multiple-Launch Rocket System (GM... Army

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A I Guided Multiple-Launch Rocket System (GMLRS)	- 3 (umber/Name) LRS Alternative Warheads
C. Other Program Funding Summary (\$ in Millions)		•	

FY 2018 FY 2018 FY 2018 **Cost To** FY 2021 FY 2022 Complete Total Cost Line Item FY 2016 FY 2017 Base OCO FY 2019 FY 2020 Total

Remarks

GMLRS procurement funding includes C65404 and C65406.

D. Acquisition Strategy

GMLRS AW is currently in Full Rate Production.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Ju	stification	FY 2018 A	ırmy							Date: May	2017	
Appropriation/Budget Activity 2040 / 7					R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple-Launch Rocket System (GMLRS) Project (Number/Name) EG3 / Guided MLRS							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EG3: Guided MLRS	-	35.726	38.044	102.807	-	102.807	164.015	119.654	36.965	40.861	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

R Accomplishments/Planned Programs (\$ in Millions)

The United States (U.S.) Army continues to explore ways to enhance Guided Multiple Launch Rocket System (GMLRS) rockets and common components and to mitigate obsolescence issues under the Guided MLRS project code. The Army is requesting funding for the following GMLRS Research, Development, Test and Evaluation (RDT&E) activities: (1) evaluation of enhanced operational capabilities to provide more flexibility across the target set to include increased range, flight performance, and end-game optimization; (2) investigation of potential life cycle cost savings through obsolescence initiatives; (3) development of enhancements to the Multiple Launch Rocket System (MLRS) common test equipment; (4) evaluation and development of technologies to enhance overall product performance and survivability; and (5) Insensitive Munitions (IM) compliance.

The FY2018 dollars in the amount of \$102.807 million will complete the testing and qualification of the Insensitive Munitions Propulsion System (IMPS); continue qualification of key rocket obsolescence upgrades (including the M-Code compliant NAVSTRIKE-M upgrade); evaluate rocket pod improvements; and initiate the design, qualification and testing of an extended range variant of the GMLRS.

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2018	FY 2018	FY 2018
	FY 2016	FY 2017	Base	oco	Total
Title: Assess and improve GMLRS rockets.	2.409	3.192	4.104	-	4.104
Description: Funding is provided for the following effort					
FY 2016 Accomplishments: Continued to assess and evaluate improvements in rocket reliability, increased range, reduced collateral damage, effectiveness, and pod enhancement studies.					
FY 2017 Plans: Continue to assess and evaluate improvements in rocket reliability, increased range, collateral damage, effectiveness, and pod enhancements.					
FY 2018 Base Plans: Investigate and assess methods to increase range performance and rocket effectiveness. Evaluate rocket pod improvements, assess rocket reliability, and reduce collateral damage.					
Title: Conduct qualification and testing for Insensitive Munitions (IM) Propulsion System (IMPS).	22.951	13.827	10.404	-	10.404

EV 2040 EV 2040 EV 2040

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			1	Date: May			
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/ PE 0205778A / Guided Multiple-L Rocket System (GMLRS)						
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
Description: Funding is provided for the following effort							
FY 2016 Accomplishments: Continued System Integration Testing and Stockpile-to-Target-Sequence te of a second Insensitive Munitions Propulsion System (IMPS) source (support Requirements Reviews (SRRs), Preliminary Design Reviews (PDRs), Critic approximately 125 Ignition Safety Devices (ISDs) and 60-90 IM rocket motor and component level qualification testing, supported component/rocket integrand eventually flight tests).	rted both component/system System al Design Reviews (CDRs), procured rs, paid for the component assembly						
FY 2017 Plans: Propulsion system ground/flight tests.							
FY 2018 Base Plans: Complete system ground/flight testing and Insensitive Munition Propulsion S	System (IMPS) qualification.						
Title: Investigate obsolescence cost/cost reduction opportunities/second so	urce suppliers/survivability.	1.549	18.505	7.417	-	7.41	
Description: Funding is provided for the following effort (The NAVSTRIKE coupled GPS/INS integration. Rockwell Collins has stopped producing the							
FY 2016 Accomplishments: Initiated design and qualification of NAVSTRIKE 3.7 obsolescence upgrade							
FY 2017 Plans: Continue qualification of NAVSTRIKE 3.7 obsolescence upgrade.							
FY 2018 Base Plans: Design and qualification of M-Code compliant NAVSTRIKE-M upgrade. Sy qualification of side-mounted proximity sensor.	stem level integration and						
Title: Conduct System Test and Evaluation activities.		8.817	2.520	2.590	-	2.59	
Description: Funding is provided for the following effort							
FY 2016 Accomplishments:							

PE 0205778A: Guided Multiple-Launch Rocket System (GM...

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A I Guided Multiple-Launch Rocket System (GMLRS)	Project (Number/Name) EG3 / Guided MLRS
D. A		FV 2040 FV 2040 FV 2040

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continued configuration definition and ground testing for the GMLRS IM Rocket Motor and Ignition Safety Device.					
FY 2017 Plans: Continue configuration ground control testing for the GMLRS IM RM and ISD.					
FY 2018 Base Plans: Ground/Flight testing of side-mounted proximity sensor.					
Title: Qualification and integration of the GMLRS extended range effort.	-	-	78.292	-	78.292
Description: Funding is provided for the following effort					
FY 2018 Base Plans:					
Define system performance requirements, select component suppliers, conduct facilitization planning, conduct preliminary design review, and conduct a flight demonstration.					
Accomplishments/Planned Programs Subtotals	35.726	38.044	102.807	-	102.807

C. Other Program Funding Summary (\$ in Millions)

			FY 2018	FY 2018	FY 2018					Cost To	
<u>Line Item</u>	FY 2016	FY 2017	Base	OCO	<u>Total</u>	FY 2019	FY 2020	FY 2021	FY 2022	Complete	Total Cost
 GMLRS (C64400): 	251.060	402.579	273.445	189.544	462.989	180.409	319.623	268.534	358.795	Continuing	Continuing
GMLRS (C64400)											
 GMLRS Alternative 	0.306	_	-	-	-	-	11.700	14.700	24.700	Continuing	Continuing
Warheads (EG2): GMLRS											
Alternative Warheads (EG2)											
 GMLRS MOD (C57701): 	5.321	0.395	0.531	-	0.531	0.269	15.530	53.182	101.854	Continuing	Continuing
GMLRS MOD (C57701)											

Remarks

GMLRS Procurement funding includes C65404 and C65406.

D. Acquisition Strategy

Project EG3 is intended to support, investigate, and develop alternative material changes to improve the GMLRS family of munitions as they are identified by the material developer or combat developer. This project also supports IM activities to improve the overall posture of the system down to component level. Two Insensitive Munition Propulsion Systems (Rocket Motor and Ignition Safety Device) suppliers will complete design and qualification, and the IMPS will be integrated into the GMLRS

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0205778A / Guided Multiple-Launch Rocket System (GMLRS)	Project (Number/Name) EG3 / Guided MLRS
rocket. Design, development, and qualification of a side-mounted proximity se GMLRS extended range effort will be a 36 month development and qualification	nsor will provide a cost reduction initiative an on effort leveraging existing contract vehicles	d improved area munition lethality. The where practicable.
E. Performance Metrics N/A		
IV/A		

PE 0205778A: Guided Multiple-Launch Rocket System (GM... Army

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army

R-1 Program Element (Number/Name)

Project (Number/Name)

Date: May 2017

Appropriation/Budget Activity 2040 / 7

PE 0205778A I Guided Multiple-Launch

EG3 / Guided MLRS

Rocket System (GMLRS)

Cost Category Item & Type Activity & Location Sovernment Program MIPR PFRMS Project Office, : RSA			FY 2	2016	FY 2	2017	FY 2 Ba		FY 2		FY 2018 Total				
Cost Category Item	Method	Performing	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To	Total Cost	Target Value of Contract
Government Program Management	MIPR		0.050	2.104	Oct 2015	2.721	Oct 2016	5.425	Oct 2017	-		5.425	Continuing	Continuing	Continuing
		Subtotal	0.050	2.104		2.721		5.425		-		5.425	-	-	-

Remarks

PFRMS-Precision Fires Rocket and Missile Systems; RSA-Redstone Arsenal, Alabama

Product Developmer	oduct Development (\$ in Millions)		FY 2	2016	FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To	Total Cost	Target Value of Contract
Unitary Contracts/Multiple	SS/FPIF	LMMFCS : Dallas, TX	8.998	8.287	Jan 2016	18.976	Jan 2017	8.629	Jan 2018	-		8.629	Continuing	Continuing	Continuing
IM Qualification Contracts/ Multiple	C/FPIF	Orbital ATK, Aerojet Rocketdyne : Rocket Center, WV; Bristow, VA	0.000	16.518	Jan 2016	13.827	Jan 2017	10.404	Jan 2018	-		10.404	0.000	40.749	0.000
GMLRS Extended Range	SS/TBD	TBD : TBD	0.000	-		-		75.759	Jan 2018	-		75.759	Continuing	Continuing	Continuing
		Subtotal	8.998	24.805		32.803		94.792		-		94.792	-	-	_

Remarks

SS/FPIF-Sole Source/Fixed-Price Incentive Firm; LMMFCS - Lockheed Martin Missile and Fire Control System; TX - Texas; C/FPIF - Competitive/Fixed-Price Incentive Firm; WV - West Virginia; VA - Virginia; TBD - To Be Determined

Test and Evaluation (\$ in Millions)				FY 2	2016	FY 2	2017	FY 2 Ba		FY 2	2018 CO	FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	WSMR, : NM	1.989	8.817	Oct 2015	2.520	Oct 2016	2.590	Oct 2017	-		2.590	Continuing	Continuing	Continuing
		Subtotal	1.989	8.817		2.520		2.590		-		2.590	-	-	-

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Exhibit R-3, RDT&E	Project C	ost Analysis: FY 2	2018 Army	/								Date:	May 2017	7	
Appropriation/Budg 2040 / 7	F					PE 020	•	Guided N	Number/N Multiple-La)	•	Project (Number/Name) EG3 / Guided MLRS				
Test and Evaluation	ı (\$ in Milli	ons)		FY	2016	FY:	2017	1	2018 ase	1	2018 CO	FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks WSMR, NM-White Sands	Missile Rang	ge, New Mexico										_			
			Prior Years	FY	2016	FY	2017	1	2018 ase	1	2018 CO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
		Project Cost Totals	11.037	35.726	i	38.044		102.807	7	-		102.807	-	-	-

Remarks

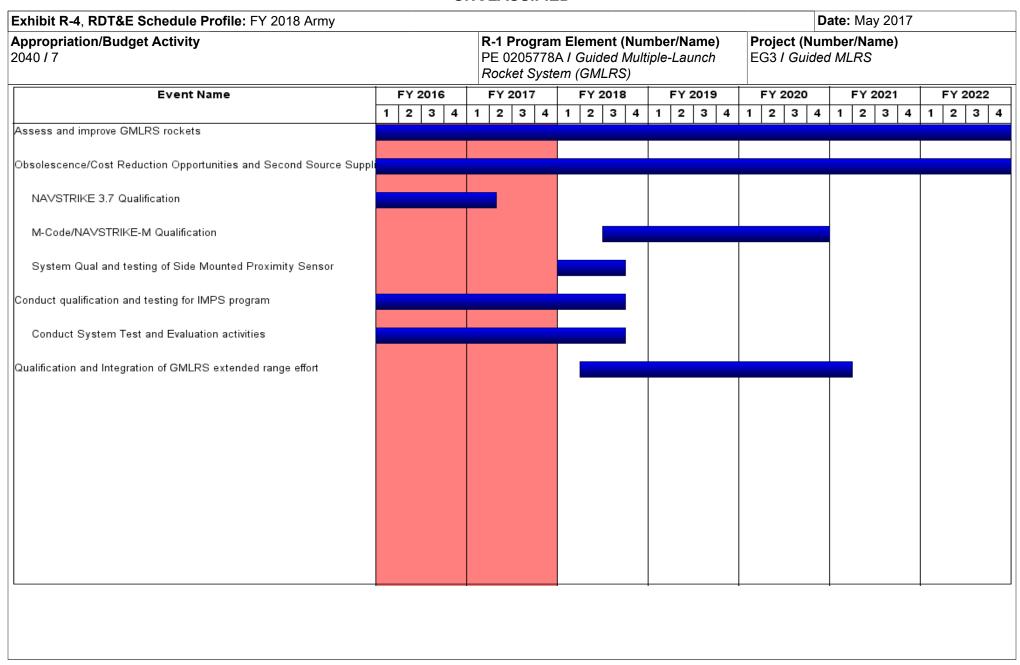


Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 7	,	Project (N EG3 / Guid	umber/Name) ded MLRS

Schedule Details

	St	art	End		
Events	Quarter	Year	Quarter	Year	
Assess and improve GMLRS rockets	1	2015	4	2022	
Obsolescence/Cost Reduction Opportunities and Second Source Suppliers	1	2015	4	2022	
NAVSTRIKE 3.7 Qualification	1	2016	2	2017	
M-Code/NAVSTRIKE-M Qualification	3	2018	4	2020	
System Qual and testing of Side Mounted Proximity Sensor	1	2018	3	2018	
Conduct qualification and testing for IMPS program	1	2015	3	2018	
Conduct System Test and Evaluation activities	4	2015	3	2018	
Qualification and Integration of GMLRS extended range effort	2	2018	1	2021	